Photo: Jon Hellin

**Women are active participants in the Kamayoq school and some have become Kamayoqs themselves.**

# The Kamayoq in Peru: farmer-to-farmer extension and experimentation

**Jon Hellin, Carlos De la Torre, Javier Coello and Daniel Rodríguez**

Governments have largely been responsible for research and the provision of extension services in Latin America. The emphasis has been on the transfer of technology, paying little attention to farmer innovation and experimentation. During the 1990s, however, structural adjustments led to a breaking down of classical agricultural research and extension services, to the extent that these services are now unable to address the needs of farmers living in marginal environments. In Peru, for example, the government agricultural extension programme run by what is now the *Instituto Nacional de Investigación Agraria* (INIA) employed 1400 extension officers in 1986, but fewer than 100 officers in 1992.

Private research and extension provision was expected to replace that previously provided by government. Few resource-poor farmers, however, are able to pay for this service and, as a result, it has generally been directed at larger commercial farmers. However, there have been a number of less well-known extension initiatives that have been able to address smallholder farmers' development needs. The defining characteristic of these initiatives has been the training of farmer-to-farmer extension agents who both provide technical advice and encourage farmer innovation and experimentation. One such initiative is the *Kamayoq* in the highlands of Peru.

## The Kamayoq and provision of extension services

Since the 1990s, Practical Action (formerly known as ITDG), a non-government development organisation, has been working in Quechua-speaking farming communities in the Peruvian Andes. Initially, the focus was on communities living in the valleys above 3500 metres. Here, the most common crops are maize, potatoes and beans. Many families also have one or two head of cattle each, some sheep and a number of guinea pigs (a food staple in the Andes). Since 2003, the focus of Practical Action's work has broadened to include communities living at over 4000 m, where livelihoods depend on a combination of alpaca-raising and potatoes.

For over 500 years, the Quechua, like most Latin American indigenous peoples, have been undervalued and marginalised. Practical Action recognised that one of the most effective ways to address farmers' needs was through a farmer-to-farmer extension approach that also encouraged farmer experimentation. Influenced by the pedagogic approach of the Brazilian educator Paulo Freire, Practical Action had had some experience with this approach in Kenya, where it had been involved in the training of "bare-footed" vets. In Peru, Practical Action developed a similar training approach: one that respects the cultural and social context of local farmers and which places an emphasis on active farmer participation and learning by doing.

In the early 1990s, Practical Action began to train a number of farmer extension agents, known locally as *Kamayoq,* focusing initially on irrigation techniques. The word *Kamayoq* actually dates from the time of the Inca Empire: they were a group of respected people who were able to predict the climate and, hence, were responsible for recommending suitable dates for sowing and other agricultural activities. In recognition of their importance, the *Kamayoq* were given food and land by the Inca State. The use of the word *Kamayoq* in Practical Action's work reflects a link to the Quechua people's historical past.

By the mid-1990s, Practical Action had recognised that smallholder farmers' needs could best be met by broadening the focus beyond irrigation. In 1996, the project being implemented received increased donor funding and established a *Kamayoq* school in Sicuani, 140 km south of the city of Cusco, with the objective of training a group of farmers who would then be responsible for training other villagers. The school has been operating ever since. The farmers who receive training are selected by their communities, although there are a number of criteria that have to be met before a farmer can enrol at the school: the farmer has to be dedicated to agriculture, live in an agricultural community, and be an active member of that community. There is also a preference for farmers who are married and with children. There are no requirements, however, with respect to educational level, age or proficiency in Spanish. The *Kamayoq* are expected to return to their villages and train neighbouring farmers in many of the techniques that they have learnt at the *Kamayoq* school.

Practical Action has ensured that the *Kamayoq* do not become the promoters of off-the-shelf technologies. On the contrary, the objective is to encourage the *Kamayoq* to work with farmers to generate creative solutions to local agricultural and veterinary problems, a process known as Participatory Technology Development (PTD). This is important for two main reasons: firstly, active farmer participation is widely recognised as one of the key components of rural development. The confidence that comes from participation increases farmers' ability to learn and experiment. Second, the ability to innovate is vital because biophysical, social and economic conditions change and farmers need to be able to adapt to these changing circumstances. Furthermore, farming conditions in the Andes are so complex and diverse that it is difficult to find a ready-to-use technology that needs no further adaptation.

A successful extension programme is therefore more likely to involve active farmer participation and to be characterised by joint problem solving rather than standardised solutions. This philosophy has been instilled in the *Kamayoq* from the beginning. The *Kamayoq* are encouraged to see themselves as key players in a two-way flow of information from the individuals and institutions promoting development, and from the local farmers to these same individuals and organisations. In this sense, the *Kamayoq* can be seen as facilitating the inter-cultural communication between the Quechua and the Spanish worlds.

### The Kamayoq school

Training courses at the school take place over an eight-month period, during which there are approximately 27 training sessions. To date, approximately 200 *Kamayoq* have been trained, of whom 15 percent are women. At the school, training partly takes place in the classroom (in Sicuani), but mainly in different field locations so that the *Kamayoq* can "learn by doing". Workshops take place in different communities, each of which has specialised in one or more key technologies. Instructors at the school include staff from Practical Action, long-serving *Kamayoq* and experts from regional universities in the cities of Puno and Cusco. During the training, the *Kamayoq* also visit INIA's experimental stations, other NGOs working in the region, as well as large-scale farmers. Throughout their training, the *Kamayoq* establish contact with technical experts from the private and public sectors and with other farmers, a useful network which they can tap into when they need information and technical advice once they finish their training. This "social capital" is recognised by many as one of the greatest benefits of the whole course.

At the end of each eight-month course there is an internal evaluation. The evaluation covers the content of the training as well as the quality of the trainers. Based on this evaluation the following year's course is revised. For example, in 1996-1997 the school focused on five technical themes: irrigation, Andean crops, horticulture, livestock and forestry. These themes were selected on the basis of the agricultural needs of local farmers. As a result of the evaluation, the course was amended, and agro-industry and marketing was added as a sixth technical speciality area after 2000. This new area included subjects such as the elaboration of business plans for small agricultural businesses as

### The Kamayoq and the search for a natural medicine

One of the biggest problems in sheep and cattle in the Andes is the parasitic disease Fasciola hepatica, commonly known as "sheep liver fluke." This is a somewhat misleading name because the parasite is commonly found in cattle and guinea pigs, as well as in sheep. The vector responsible for the spread of the parasite is the common snail. Although F. hepatica rarely kills animals, it does incapacitate them (sick animals often weigh a third less than healthy ones). Infected bulls sell for under US$ 70 per animal, while healthy bulls sell for US$ 115 each. In the case of cows, there is a reduction of over 50 percent in milk production from infected animals. Weakened animals are also susceptible to a number of secondary diseases.

Few farm families can afford conventional medicines to control the disease. F. hepatica, therefore, represents a real threat to local people's livelihoods. The discovery of a natural medicine to treat and control F. hepatica depended on a process of participatory research and development guided by the Kamayoq. A natural cure for F. hepatica in sheep was earlier discovered by Apolinar Tayro, a farmer from the community of Pampa Phalla who later became a Kamayoq. Between 1998 and 2000, the same farmer, along with Practical Action, national researchers and local villagers, experimented with a cure for F. hepatica in cattle as opposed to just sheep. Farmers played a direct and active role throughout. Farmers focused on a number of plants that were known to have medicinal properties. They tested medicines made from different combinations of these plants on their own infected animals. Experiments were designed to ensure that any treatment could subsequently be easily prepared and administered by the farmers themselves. The medicine, which contains garlic and artichoke, is administered to the animals in oral form. Farmers are now involved in experiments to find a cure for F. hepatica in alpacas.

The widespread use of the medicine has led to fewer sick animals, higher milk yields and diversification into a range of milk products including yoghurt and cheese. The natural medicine is also cheaper than conventional medicines. The cost of treating a sick animal with conventional medicine is approximately US$ 2.5 per animal. In the case of the natural medicine, it is US$ 0.60 per animal. We estimate that over 3000 families now use the natural medicine for controlling F. hepatica in the highland provinces near to Sicuani, and that villagers have treated approximately 30 000 cattle and 7000 sheep.

well as agrarian law. In all, the six technical themes currently cover topics ranging from soil fertility to greenhouse vegetable production and cheese-making.

Language was an issue that was often mentioned in the earlier evaluations. The *Kamayoq* suggested that more Quechua and less Spanish be used in the trainings. There was also a request that the trainers used simpler words. The use of an alienating language, Spanish, is a particular issue for women. Hence, since the 1999-2000 course, the school also provides courses in the grammar and writing of Quechua.

The key to the success of the *Kamayoq* model is that farmers highly value the assistance provided by their fellow *Kamayoq* and are willing and able to pay for this assistance. Farmers pay the *Kamayoq* for their services in cash, in kind or in the promise of future help through an indigenous system known as "*ayni*". It is farmers' willingness to pay that makes the *Kamayoq* model so interesting. It is largely an unsubsidised farmer-to-farmer extension service with external financial resources only being needed to cover the cost of the training provided at the *Kamayoq* school.

Photo: Jon Hellin

**The Kamayoq are involved in many activities. Here, they are providing advice on honey production.**

## Combining participatory research and development and farmer-to-farmer extension

Local farmers and *Kamayoq* work together to resolve priority agricultural problems. To date, examples of successful participatory research and development initiatives have included the treatment of a maize fungus disease; the control of mildew on onions; and treatment of animal diseases. The most sought-after service is the last of these, i.e. the diagnosis and treatment of various animal diseases. In each of the communities where *Kamayoq* live and work, mortality rates among sheep and cattle have fallen dramatically. One of the most interesting results of farmer innovation and experimentation has been the development of a natural medicine to control the "sheep liver fluke" (see Box p. 33).

## Impact and scaling-up

The *Kamayoq* school is not expensive to run, and in some cases the *Kamayoq* are able to pay for part of their training. Still, it is unrealistic to expect them to cover more than a small percentage, so the continued success of this development initiative requires external funding. Another difficulty has been trying to get the support of the local government, or linking this experience with the existing technical schools found in the region. Many of these have discontinued their agricultural courses due to less demand, while the national government has still not defined a clear strategy towards extension or agricultural development.

However, the impacts of the *Kamayoq* are overwhelmingly positive. While farmers in this region used to produce only subsistence crops, they now, particularly the women, produce both subsistence crops and also onion and carrots, which they sell in the market. A very positive result is that most families have tended to use the increased income from market sales to pay for the education of their children.

At the same time, farmers are better able to detect animal diseases and take evasive action. In the past, they would often wait until the animals were sick and then seek a technician who tended to over-charge them, or just let the animals die. As mentioned, in the farming communities where the *Kamayoq* have been active, mortality rates among cattle have fallen dramatically. There is also evidence that the improvement in food security (brought about by improved agricultural and animal production) has led to the more sustainable use of natural resources.

More importantly, there has been an increase in self-confidence among the *Kamayoq* and the farmers who have been attended by the *Kamayoq*. Most seem willing to take part in local trials and experiments, something that has led, for example, to them growing other crops. In 1998, a group of trained *Kamayoq* established the legally-recognised "*Asociación Kamayoq Toribio Quispe*", as an organisation which could represent them. The *Kamayoq* are increasingly being contracted by public and private organisations to extend the farmer-to-farmer training well beyond the communities and region where the *Kamayoq* have operated to date. In these cases, the *Kamayoq* are paid to act as technical instructors and the *Kamayoq* association facilitates this process. ■

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